



**west virginia** department of environmental protection

Division of Air Quality  
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Randy C. Huffman, Cabinet Secretary  
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**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: R13-2863  
Plant ID No.: 039-00044  
Applicant: Cranberry Pipeline Corporation (CPC)  
Facility Name: Staten Run Compressor Station  
Location: Montgomery, Kanawha County  
SIC Code: 1311  
NAICS Code: 211111  
Application Type: Modification  
Received Date: October 8, 2010  
Engineer Assigned: Jerry Williams II, P.E.  
Fee Amount: \$1,000.00  
Date Received: October 8, 2010  
Complete Date: November 3, 2010  
Due Date: February 1, 2011  
Applicant Ad Date: October 13, 2010  
Newspaper: *The Montgomery Herald*  
UTM's: Easting: 471.75 km      Northing: 4226.49 km      Zone: 17  
Description: Replacement of the existing glycol dehydration unit reboiler.

**DESCRIPTION OF PROCESS**

The following process description was taken from Permit Application R13-2863:

The changes associated with this application include the dehydration unit maximum throughput be changed from 30 mmscfd to 16 mmscfd. The reboiler size is decreased from 0.85 MMBTU/hr to 0.75 MMBTU/hr. A BTEX eliminator is also being installed to reduce still vent emissions. One (1) flash tank will be included to receive the rich glycol before it enters the regenerator. The remaining processes will not change.

Natural gas enters the facility via pipeline at a relatively low pressure. Natural gas fired engines power compressors that compress the gas to a higher pressure. The products of combustion from burning pipeline quality natural gas by the engines are vented through exhaust stacks.

Before compression, the natural gas is processed by a triethylene glycol (TEG) dehydration unit. The dehydration unit uses TEG to absorb water from the natural gas by contacting the wet gas in a contacting tower. The TEG flows downward and countercurrent to the wet gas flow. Trays in the tower maximize the contact between the wet gas and the glycol. This process efficiently removes water from the wet gas stream. The dehydrated gas (i.e., dry gas) leaves the top of the tower and is transferred to the natural gas compressor engines.

The rich (wet) TEG leaves the bottom of the contacting tower and is routed through the BTEX Eliminator condenser prior to being routed to a flash tank and dehydration system reboiler. The rich TEG is used as a coolant in the BTEX condenser. The rich TEG is then sent to a flash tank before returning to the regenerator. The reboiler regenerates the rich TEG by boiling off the water through a still vent. The regenerated TEG or lean TEG is routed back to the contacting tower for reuse. The still vent emissions, which contain VOCs that were trapped in the TEG along with the water, are transferred to the BTEX Eliminator system that condenses the steam and trace TEG. The reboiler combusts pipeline quality natural gas to generate the required heat. Stripping gas, a portion of the dehydrated gas, is routed to the reboiler and introduced to the rich TEG to support drying of this TEG.

Condensate, with trace TEG is drained from the BTEX condenser to storage. The entrained BTEX vapors are separated from the condensate and injected into the reboiler burner when it is operating. When the reboiler burner shuts down, the BTEX vapors are sent to the reboiler exhaust stack where they are contacted with an igniter to achieve thermal degradation. This mode of operation persists until the reboiler is restarted. Emissions from the reboiler exhaust stack are comprised of the combustion products of the natural gas fuel and BTEX vapors extracted from the reboiler still vent.

## SITE INSPECTION

A site inspection was conducted on February 4, 2009 by Fred Teel of the DAQ Enforcement Section. The facility was operating in compliance at that time.

Directions as given in the permit application are as follows:

*Traveling southeast on US Route 60 from Glasgow, WV, travel approximately 7.2 miles towards Montgomery. The station gate is on US Route 60 on the left hand side of the road. The station is located approximately 0.2 miles from the gate.*

### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Maximum controlled point source emissions associated with Permit Application R13-2863 from CPC's Staten Run Compressor Station are summarized in the table below.

Emission Point ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
			Hourly (lb/hr)	Annual (ton/year)
001-04A	12 MMscfd Glycol Dehydrator Still Column	Nitrogen Oxides	0.08	0.33
		Carbon Monoxide	0.07	0.28
		Volatile Organic Compounds	0.01	0.02
		Sulfur Dioxide	0.01	0.01
		Particulate Matter-10	0.01	0.03
001-04B	0.75 mmBTU/hr Glycol Dehydrator Reboiler	Volatile Organic Compounds	0.29	1.26
		Benzene	0.03	0.11
		Ethylbenzene	0.01	0.01
		Toluene	0.02	0.08
		Xylenes	0.03	0.10
		n-Hexane	0.02	0.07

The following table indicates the control efficiencies that are achieved from controlling the Glycol Dehydration Unit Still Vent (RSV-1) with the BTEX Eliminator System (1C):

Control Device ID	Control Device	Emission Unit	Pollutant	Control Efficiency
1C	BTEX Eliminator System	0.75 mmBTU/hr TEG Dehydration Unit Reboiler Still Vent	Benzene	96 %
			Toluene	97 %
			Ethylbenzene	98 %
			Xylenes	99 %
			Hexanes	95 %

## REGULATORY APPLICABILITY

*Unless otherwise stated WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.*

The following rules apply to the facility:

### **45CSR4** (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

### **45CSR10** (To Prevent and Control Air Pollution from the Emission of Sulfur Oxides)

45CSR10 Section 10.1 states that any fuel burning units having a design heat input under ten (10) million BTU's per hour will be exempt from section 3 and sections 6 through 8. However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. Therefore, the 0.75 MMBTU/hr Glycol Dehydrator Reboiler would meet this criteria.

45CSR10 Section 4.1 states that no person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide concentration exceeding 2,000 parts per million by volume from existing source operations. Therefore, the Glycol Dehydrator Reboiler is limited to a maximum of 2,000 ppm<sub>v</sub>.

45CSR10 Section 5.1 states no person shall cause, suffer, allow or permit the combustion of any refinery process gas stream or any other process gas stream that contains hydrogen sulfide in a concentration greater than 50 grains per 100 cubic feet of gas except in the case of a person operating in compliance with an emission control and mitigation plan approved by the Director and U. S. EPA. In certain cases very small units may be considered exempt from this requirement if, in the opinion of the Director, compliance would be economically unreasonable and if the contribution of the unit to the surrounding air quality could be considered negligible. Compliance with the Federal Energy Regulatory Commission (FERC) limit for H<sub>2</sub>S is 0.25 grains per 100 cubic feet. Pipeline quality natural gas has a low H<sub>2</sub>S content, therefore if the incoming pipeline quality natural gas meets the FERC limit, this standard will be met.

**45CSR13** (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that CPC is replacing the existing glycol dehydration unit reboiler.

**45CSR22** (Air Quality Management Fee Program)

The changes associated with this Permit Application will bring the facility's HAP emission levels below the 45CSR30 (Title V) major source thresholds. Therefore, CPC will no longer be subject to 45CSR30 permitting requirements. CPC plans to submit a request for inactive status of their Title V Permit upon the issuance of this permit.

The following rules do not apply to the facility:

**45CSR30** (Requirements for Operating Permits)

The changes associated with this Permit Application will bring the facility's HAP emission levels below the 45CSR30 (Title V) major source thresholds. Therefore, CPC will no longer be subject to 45CSR30 permitting requirements. CPC plans to submit a request for inactive status of their Title V Permit upon the issuance of this permit.

The following rules may apply to the facility:

**40CFR63 Subpart ZZZZ** (National Emission Standards for Reciprocating Ignition Internal Combustion Engines)

**40CFR63 Subpart HH** (National Emission Standards for Hazardous Air Pollutants: Oil and Natural Gas Production and National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

**40CFR63 Subpart HHH** (National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

These promulgated national emission standards for hazardous air pollutants (NESHAP) limit emissions of hazardous air pollutants (HAP) from oil and natural gas production and natural gas transmission and storage facilities. These final rules implement section 112 of the Clean Air Act (Act) and are based on the Administrator's determination that oil and natural gas production and natural gas transmission and storage facilities emit HAP identified on the EPA's list of 188 HAPs.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

## AIR QUALITY IMPACT ANALYSIS

The changes to this facility do not constitute a major modification under 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality analysis was performed. However, air dispersion modeling will be required if the Director finds existing circumstances and/or submitted data that provide cause for an assessment to be made concerning whether this facility may interfere with attainment or maintenance of an applicable ambient air quality standard or cause or contribute to a violation of an applicable air quality increment.

## MONITORING OF OPERATIONS

CPC will be required to perform the following monitoring, recordkeeping, and reporting:

1. Monitor and record quantity of condensate produced by the BTEX Eliminator.
2. Monitor and report any malfunctions associated with the BTEX Eliminator.
3. Maintain records of the natural gas throughput to the glycol dehydration unit.
4. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by CPC for a period of five (5) years.

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates CPC's Staten Run Compressor Station meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Kanawha County location should be granted a 45CSR13 modification permit for their facility.

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Jerry Williams II, P.E.  
Engineer

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Date